

# PLASTICS

A Periodical Devoted to the Manufacture and Use of Composition Products

NOVEMBER, 1925



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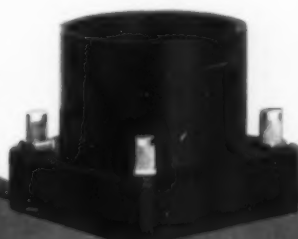
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*Write for Booklet No. 51*

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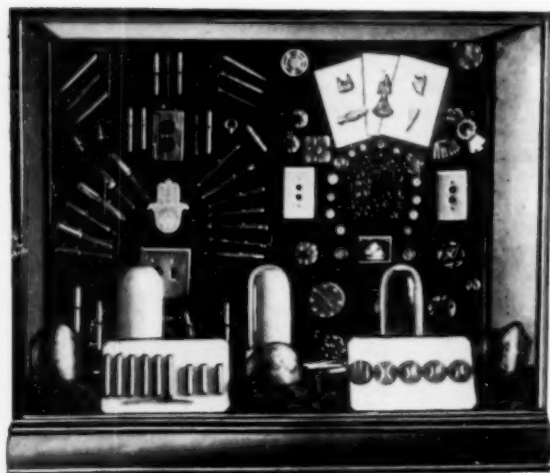
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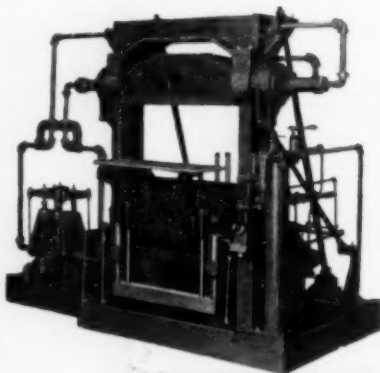
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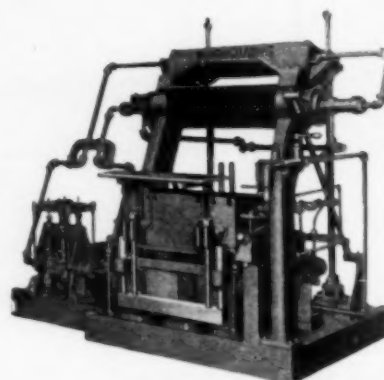
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Centralized valve control.

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Head Tilts giving unobstructed view and access to upper and lower dies.

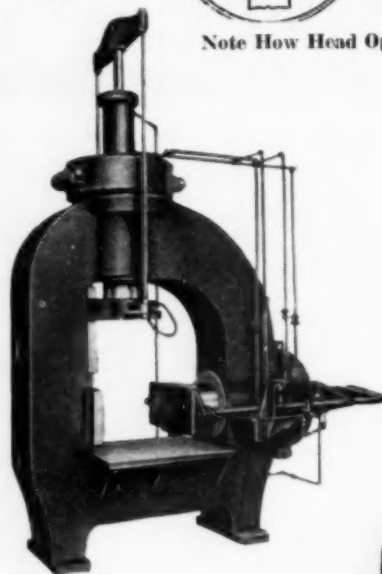
Short stroke due to Tilting feature low water consumption.



Open Position



Note How Head Opens Like a Book



### RODLESS HYDRAULIC PRESS FOR HAND MOULDS

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Rodless Type for Production moulding with direct heated and chilled moulds for moulding pieces requiring split dies.





**A**S publisher of PLASTICS, we are now at liberty to feel all puffed up with pride. After the usual vicissitudes that business paper publishers are subject to, this magazine was finally placed in the mails and launched beyond recall. With bated breath we waited for the opinions of the trade, and thanks be we did not have long to wait. There is one thing a publication cannot stand and that is to be ignored, and PLASTICS quickly and immediately felt the response of the men in the trade.

The telephone began ringing; telegrams began arriving; and the postman snarled in with one of the biggest mails we had ever received.

These messages all sang paeans of praise for the magazine. Mr. Lacey of the Erinoid Company called and said, "Let me congratulate you. Send me a few extra copies to send away." Mr. Brown of the Bakelite Corporation said, "Plastics is a good book. It looks just right in every way." Evarts G. Loomis phoned, "It's wonderful. Count on my cooperation in every particular."

Most of the letters proved their appreciation by saying, 'enclosed find check for subscription.' In many cases these were accompanied with pleasant notes. Dr. E. C. Worden wrote, "I have read your first issue with great interest, especially the article on trade names." W. F. Kaynor of the Waterbury Button Co. wrote, "We wish to compliment you on Plastics. It is an excellent bit of work and something that we, for one, are convinced this country has long had need of. We enter our subscription and hope to get more subscribers and advertisers for you." Hydraulic Press Mfg. Co. said, "We believe that your publication has a very definite place in the industry and will use it regularly for advertising."

This is the kind of appreciation that spurs us on to do even better and greater things for the industry. *The Publisher.*

# PLASTICS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 1

November, 1925

No. 2

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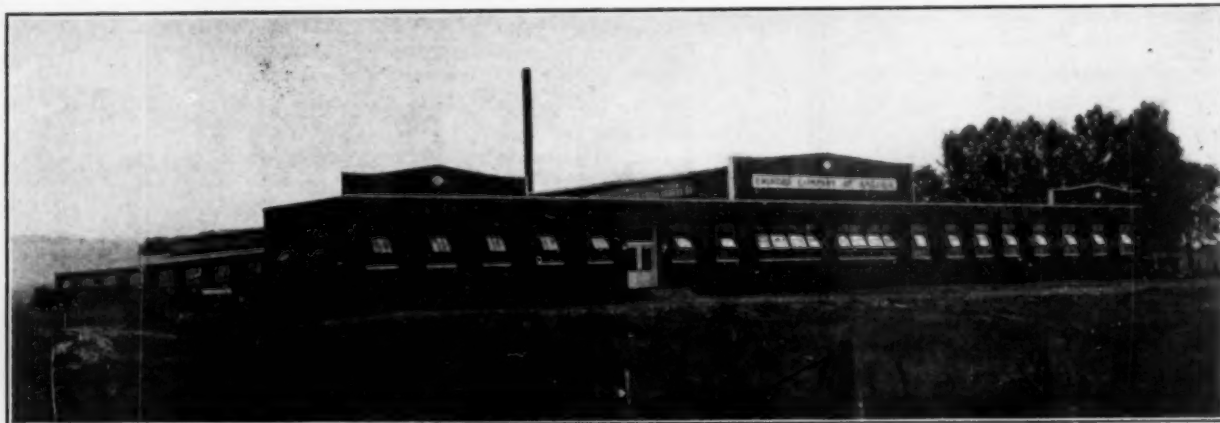
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# PLASTICS

A periodical devoted to the manufacture  
and use of plastic and composition products

Vol. 1

NOVEMBER, 1925

No. 2

## Problems of the Toilet Ware Industry

In which are discussed the increasing use of seconds,  
price cutting, and the advantages of organization

By Leo Marder

Treasurer, Art Ivory Co., Brooklyn, N. Y.

THE pyroxylin toilet ware industry is face to face with a problem which is of the greatest import to everyone engaged in it and to the industry itself. What I refer to is the continued cheapening of our merchandise by the use of constantly diminishing weights of material, imitation bristles in brushes, shock glass in dresser mirrors and jobs and seconds of various kinds which combined with indifferent workmanship is producing large quantities of sets of poor quality, for the most part lacking in appearance and more important still, lacking in utility. Combined with this is the steady precipitate cutting of prices generally not based on savings in cost and continually disrupting price levels and wiping out margins of profit. Please note here that I am not inveighing against all low priced merchandise for I believe some of it has its place but I am pointing out as a serious problem the debauching of the more expensive goods which should be made to satisfy a demand for higher priced and better merchandise.

The conditions just mentioned

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*Mr. Marder is chairman of the Toilet Ware Division of the Pyroxylin Fabricators Association and can speak authoritatively on conditions in this industry.*

*Realizing that the future prosperity of the trade lies in better business methods on the part of the manufacturers, Mr. Marder appeals to the industry.*

---

are to a great extent the result of an overabundant productive capacity combined with a narrowing of the season when our goods are in active demand by distributors to the three or four months preceeding Christmas.

The direct manifestations of all this are sets made at very cheap prices and retailing to correspond, either very low in quality or entirely too much value for the money. The ultimate would-be purchasers are bewildered and those willing and able to buy the better merchandise and desiring something that is recognized as valuable will sooner or later be repelled by the low priced sets and turn to other

wares. Psychologically this is logical and when this condition comes about the industry will have something real to worry about. Already we hear that decorators are advising that toiletware be kept in drawers. And it is a fact that quite a few people turn to brushes of other materials thinking they cannot find pyroxylin brushes that will be completely serviceable in every day use. Such tendencies should give us considerable concern and no time should be lost in an effort to divert them into a course favorable to our industry.

What is the remedy for the situation? To state that manufacturers shall not produce such goods is not sufficient. Self preservation and self interest in certain cases make it difficult for a manufacturer to abstain from the practices noted. Nor is every one equipped to manufacture and capable of distributing quality merchandise at more or less fixed prices. However, a realization of the situation and its consequences, a determination to keep from further debasing the line and from per-

(Continued on page 61)

# Jimmy Goes Into the Molding Business

He learns a lot about hydraulic presses  
that he little dreamed about before

By W. E. Rahm

Chief Engineer, The Burroughs Co., Newark, N. J.

**J**IMMY SMITH having worked for a number of years as a molder and having saved a few dollars decides that the molding of insulation parts would be a profitable business for him to engage in, especially so since the demand for molded parts caused by the advent of radio has increased by leaps and bounds. Jimmy therefore, quits his job and starts to look around for suitable equipment. He learns that his money is insufficient and borrowing will be necessary. Jimmy, luckily has a wealthy uncle to whom he can go for funds. Uncle, however, wants to know what he is going to buy with his money, to which Jimmy

replies: "Some Hydraulic Presses, Hand Pumps and Molds."

"What's a Hydraulic Press," asks Uncle? Well says Jimmy, "Its an iron cylinder with a ram in it, four posts or rods with nuts on each end, a top head and a couple of steam plates between the head and the ram."

Little does Jimmy realize that there is more to an Hydraulic Press than its mere outward physical appearance. Yet Jimmy, and many more like him, have the same conception of what constitutes an Hydraulic Press.

For the general type of hand molding, which is the only type

most molders are familiar with, where the mold is placed on a bench and charged with material then assembled by hand and placed between the platens of a press, there are two types of simple Hydraulic Presses available. One is known as a Rod Press having two, or more rods connecting the cylinder and head, Figure No. 1 and the Rodless type in which the head, cylinder, and uprights are cast in one piece, Figure No. 2.

It is essential in any type of press for molding, that the parts be rigid and free from deflection and stretch. Therefore a press designed for rigidity will weigh considerable more than one designed for stress only. A copper lined cylinder is also essential as its smooth non-corrosive surface prolongs the life of the leather packing which should be placed at the end of the ram away from the heat of the steam platens. This feature will cut down the number of shut-downs made necessary by repacking.

Steam plates of cast iron should be heavy enough to withstand 150 lbs. steam pressure or cold water test of 250 lbs. per sq. inch. Drilled steel steam plates should put to the same test to insure tightness of pipe plugs.

The lower platen and ram should be cast in one piece and the ram have liberal length in the cylinder to guide it. Insulator plates should be provided between the bottom steam plate and the bottom platen and top head and top steam plate. A sheet of asbestos board should be interposed between each of these parts. The idea is to heat the steam plates, not the whole press, and save steam.

## Pioneers

When John Wesley Hyatt invented Celluloid he collaborated with Charles Burroughs who designed and built the equipment necessary to manufacture this material, also the equipment for the fabrication of articles therefrom. Since that time the Burroughs Company, under Mr. Burroughs' direction and that of his successor, Mr. C. F. Burroughs, has been constantly engaged in the design and manufacture of machinery and tools for working not only Celluloid, but practically all the plastics known to the trade.

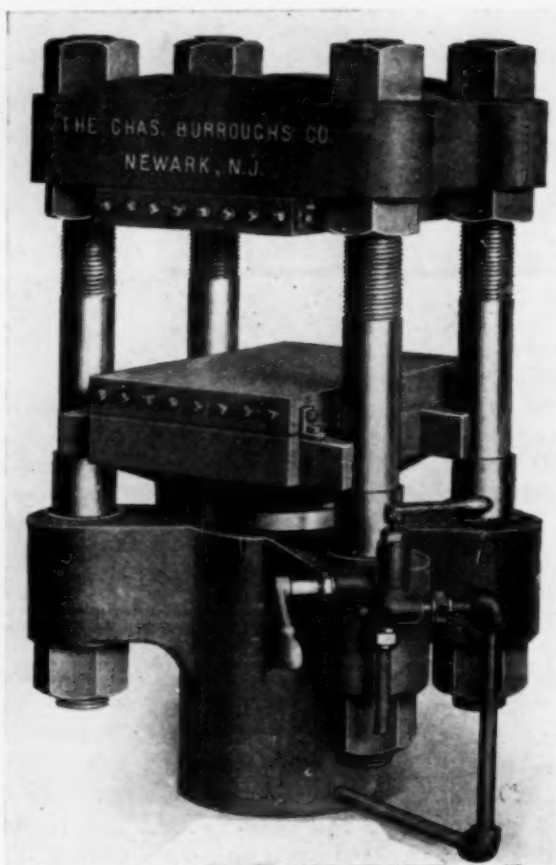


Figure 1

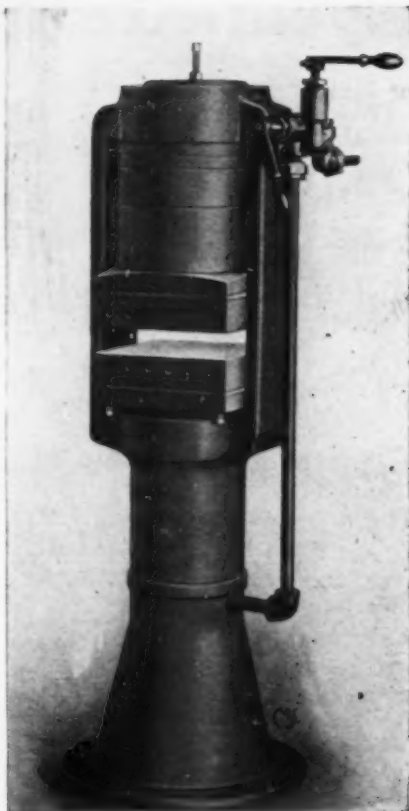


Figure 2

A Press embodying all of these features will obviously cost more than one which does not, but the increased first cost will be more than offset by the decreased cost of maintenance and shut-downs for repacking.

The Rod Type of Press especially if of cheap construction has the disadvantage that occasionally the rods will stretch and the nuts work loose throwing the press platens out of parallel. If the opening is to be varied in height it is necessary to have an experienced mechanic to accurately parallel and vary the opening if this is accomplished by moving the head up and down on the rods by adjusting nuts.

The Rodless Type Press, figure No. 2, has the advantage of compactness, rigidity, and simplicity of construction. The head is always square with the ram insuring parallel platen faces. The opening is varied by inserting or taking out parallel spacer rings.

There are two methods of operating and supplying pres-

sure to a press. The first which is the simplest and cheapest method is by means of a hand pump, figure No. 3, having high and low pressure pistons. The low pressure piston is used to take up quickly the gap between the mold and the top steam plate and apply an initial low pressure to the mold. The low pressure piston is then locked to prevent its operation and the high pressure piston used to supply the required pressure for closing the mold. The only drawback to this method is that the operator has

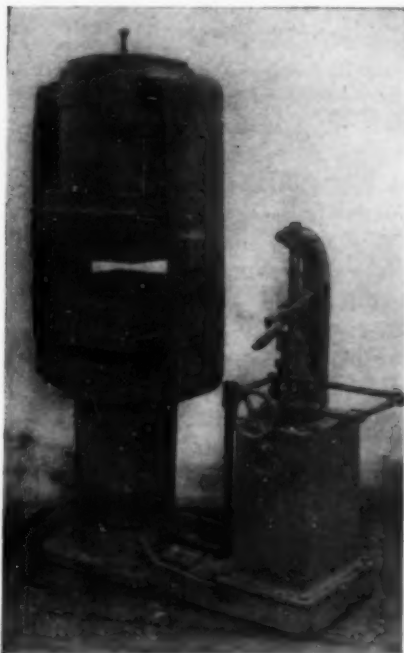


Figure 3

to watch the pressure gauge as a slight leak, or fluxing of the material in the mold will cause a pressure drop which must be taken up immediately.

The second but most dependable method of supplying pressure is by means of a power driven pump and Accumulator. This method is used where a battery of presses is to be supplied.

An Accumulator, Figure No. 4, in its simplest form is nothing more than a pressure governor consisting of a vertical cylinder with the usual stuffing box and gland having a ram therein. On top of the ram is a beam, yoke or head from which rods are suspended to carry cast iron weights, or a platform for

weighting with concrete, or a steel tank to contain scrap iron, iron ore, or ballast of any type. The weight carried by these suspension rods must be sufficient to give the desired pressure usually from 2000 to 3500 lbs. per sq. inch.

The pump when operating has to work against this pressure or head and raise these weights to a predetermined height at which point a tripping device operated by the Accumulator throws the pump out of action. This is to prevent pumping the Accumulator ram out of the cylinder or overstroking.

When a valve on a press is opened and hydraulic pressure admitted to the press cylinder, the Accumulator descends a portion of its total travel and if a sufficient quantity of water is drawn off, the tripping device throws the pump into action and causes the Accumulator to ascend to its highest position.

(Continued on page 60)

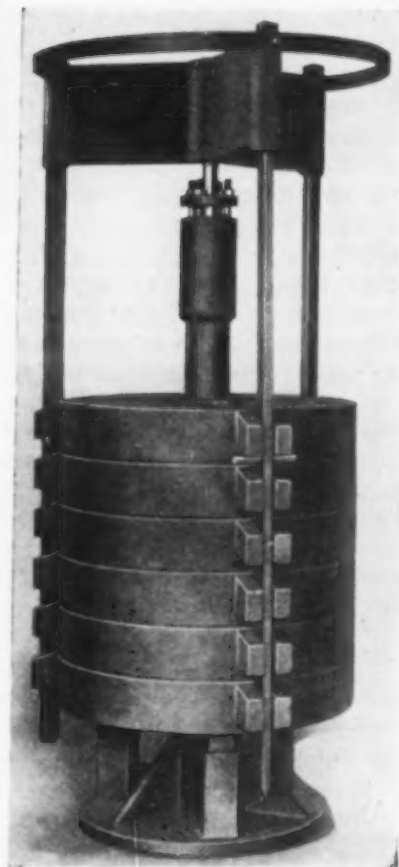


Figure 4



# Erinoid---Described and Defined

This incombustible casein plastic presents many possibilities for practical use

By L. Lacey

ONE can remember the time when the name Erinoid sounded mysteriously; when not one in a hundred could have told you what it signified. Today it is widely known, and recognized as one of the basic materials for the manufacture of a huge variety of articles of adornment and utility.

In the fancy goods trade alone it is called upon for endless purposes; yet new uses are daily being found for it. As a substitute for Jade, Coral, Ivory, Amber, Tortoiseshell, Marble, Lapis Lazuli, etc., it fulfills every requirement, having the added advantage of relative non-combustibility.

Erinoid is an up-to-date perfected casein solid which is manufactured from the waste of milk. Its invention opened up a new chapter, and by no means an inconsiderable one, in British enterprises. For, as is well known to the trade, Erinoid was first manufactured in England.

One of its charms is its wonderful color range, including many fancy effects to which it lends itself. We have, for instance, seen copies of the Chinese apple green Jade in which the imitation is astonishingly true to the natural state. In conversation with an expert on precious stones some time ago, we remember him expressing the opinion that it was one of the most exact substitutes of this rare, and highly prized stone, that he had ever seen. Indeed, according to his view, it was impossible to tell the difference between the real thing and the imitation unless one weighed a piece of each.

One of the striking forms in which Erinoid can be obtained is a transparent Tortoiseshell,

which is a perfect imitation of the original it is intended to displace. It is the final result of experiments conducted over a very long period.

The dyes used are fast and harmless. The material is non-inflammable and odorless. It is also an excellent insulator, and its working for all forms of machining, and turning, are admittedly ideal.

The British works are located at Lightpill Mills, Stroud, in the beautiful Cotswold country, and cover more than five acres, and give employment to about two hundred workers, all engaged in the production of the raw material.

As the Erinoid Co. has always declined to manufacture finished or fabricated articles, the entire energy of the workers is

devoted to the raw product, which is made in the form of Rods, Tubes and Sheets. Although originally a British product, it has now attained a world-wide reputation, and a very large plant has been constructed in New York State, where the manufacture of Erinoid will be carried out with every modern facility so that before long it will be available in large quantities, and the supply will not be limited by importations, and the hazards connected therewith.

As already stated Erinoid is an excellent electric insulator, and is thus admirably adapted for the manufacture of electrical fittings, and accessories such as radio, telephone, airplane, motor car and motor boat fittings and

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## Beef Blood Forms Base for New Horn Substitute

By Otto Kaspar

CONSIDERABLE progress has recently been made in the production of plastics from blood hardened with formaldehyde. As a specific example may be mentioned beef blood serum or albumen solution treated with formic acid, formaldehyde and hydrogen dioxide, this forming a light-colored solution which soon sets up to a jelly and eventually forms a plastic mass capable of being molded. After drying, it has many of the characteristics of horn, and if too brittle, can be rendered more pliable by the addition of phenol.

A practical example is as follows: 100 parts of blood serum are mixed with 25% of formic acid, 20 to 30 parts of trioxymethylene and 85 parts of phenol, while enough sodium dioxide, previously dissolved in water is added until the reaction remains alkaline. Finally 10 parts of sodium sulfite are added. After heating this mixture for an hour or so, the resulting mass is placed into molds in which it is heated further until it becomes solid.

This process produces an artificial mass that can be worked readily upon a lathe, can be cut, drilled, and that takes a very

(Continued on page 60)



# Will Advertising Sell Combs ?

How the Vulcanized Rubber Co. developed the market for their trade-marked comb

**C**OMB-MAKERS in foreign lands and the vogue of bobbed hair for women have brought a blessing on the heads of some American comb manufacturers. The blessing has been the discovery of the value of advertising in selling combs.

For several years foreign manufacturers have been shipping quantities of combs into this country. American manufacturers who were not anxious to compete with foreign manufacturers on a price basis when it seemed plain to them that their foreign competitors were selling goods at a price below production costs, had to think of some other way to meet this type of competition.

During this same period, American comb manufacturers soon found from retailers that the women and girls who had bobbed their hair were buying small combs that could be carried in vanity cases or pocket-books. Here was a big field that was wide open for an advertised trade-marked comb of quality designed especially for bobbed hair.

These are the reasons why the Vulcanized Rubber Company of New York—a company making practically any article that can be manufactured of hard rubber—has been advertising combs.

## "Our Business is Different"

If these two conditions had not appeared, the company would doubtless have gone along believing the old story "Our business is different; we can't advertise." Hitherto, it had been always assumed that the low retail price range—ten cents to one dollar—made it impossible to advertise combs profitably. Then, too, a feeling that

the demand for combs could not be enlarged rapidly, since the product was not in the same repeater class with articles such as chewing gums or canned soups, also made the company believe that advertising could not accomplish much in its case.

The demand for special combs for bobbed hair pointed the way



to two advertising copy themes: (1) quality; (2) special purpose combs. Instead of selling a single consumer one comb, the copy endeavors to sell several combs to each individual. In talking to a woman about combs, one piece of copy says: "Get a big one for your dresser, a smart one for your traveling case and a cunning little 'Bobbie' for your wrist bag or your purse." In selling the idea of more than one comb for a man, the advertising talks to him over the shoulder of a woman. An advertisement carrying a picture of a woman addressing her husband, and the heading "Listen Husband," illustrates how this advertiser is seeking to widen its market. The copy quotes the woman, who says:

"If you're to see that funny Mr. Brown this afternoon, the

man who's going to be the making of our fame and fortune—take this Ajax comb to the office with you, please. You've no idea how much better you look when your hair is parted properly."

## Thanks to Bobbed Hair

In other words, the company is advertising to women, who, thanks to bobbed hair, are now particularly interested in combs, in an endeavor to have them convince their husbands that men should have two combs—one for the home and one for the office.

The company's two combs for bobbed hair, trade-marked "Bobbie" and "Daintee" are its leaders. About half of its consumer advertising appropriation is used to push these two combs. The other half is given over to its general line of combs. Pictures of the different styles and types of bobbed hair are used to attract attention to copy used for the two bobbed-hair combs. A sentence or two discusses the style of bobbed hair pictured in a particular advertisement. Another sentence or two tells what type can wear that particular "bob."

All copy strives for a quality appearance. And in every advertisement three purposes are kept continually in mind: (1) Get over the trade-mark of the comb; (2) Emphasize the name of the company; and (3) Stress the point of "superiority of product."

The company sells through the jobber to the retailer. It advertises to the retailer through business papers. Its business-paper copy is chiefly concerned with explanations of its consumer campaign from the retailer's standpoint.

A special display case, in  
(Continued on page 61)

# Patents on Plastics Available to American Manufacturers

## Chemical Foundation Grants License Rights

For six years there lay untouched in the files of The Chemical Foundation, Inc., thirteen important patents on the production of synthetic methanol. For more than a year after it was known that this product was being manufactured in Germany and for several months after large importations had aroused great public interest in the subject, these patents still were unrecognized and therefore unlicensed by our manufacturers. Yet their titles and dates had been published by the Foundation soon after its organization.

What was the trouble? Might there not be other patents, likewise of great importance to other lines of industry, which have not yet been utilized?

To answer these questions, a committee of the Synthetic Organic Chemical Manufacturers' Association was appointed to confer and cooperate with the officers and staff of the Foundation. This committee consisted of:

D. B. Keyes, Chairman,  
U. S. Industrial Alcohol Co.  
G. O. Curme, Jr.,  
Carbide & Carbon Chemical Co.  
E. K. Bolton,  
E. I. duPont de Nemours & Co.  
L. V. Redman,  
Bakelite Corporation  
M. L. Crossley,  
Calco Chemical Company  
C. H. Herty, Ex-Officio

As the result of the deliberations of the committee and the effective work of the staff of the Chemical Foundation a classified list of the patents owned by the Chemical Foundation was compiled. In this grouping of the patents by subjects under the classification used by the U. S. Patent Office, we are confident that manufacturers will have a quickly available and compre-

hensive listing of all patents in which they might be interested.

Among these patents there are a number on the manufacture of Plastics, molding and die-making. In the belief that some of our readers may be interested to learn that such patents are available for license, we reproduce the list which is given on page 2 of the compilation above referred to.

United States Patents on Plastics Class 18. Sub-class.

- |   |  |   |  |
|---|--|---|--|
| 1. Miscellaneous.   |  | 48. Processes—Miscellaneous.                  |  |
| 1,180,850   |  | 955,360                                       |  |
| 2. Vulcanizable Gums, Apparatus.                                    |  | 972,723                                       |  |
| 964,244   |  | 997,056                                       |  |
| 1,048,892   |  | 1,031,227                                     |  |
| 1,260,684   |  | 1,074,983                                     |  |
| 8. Molding Devices—Filament Forming.                                |  | 1,083,275                                     |  |
| 957,460   |  | 1,142,619                                     |  |
| 13. Molding Devices—Die Expressing—Compound.                        |  | 48.8 Processes—Imitating Marble.              |  |
| 1,095,979   |  | 1,000,425                                     |  |
| 17. Molding Devices—Presses—Heating and Vulcanizing.                |  | 1,042,113                                     |  |
| 1,122,465   |  | 1,120,632                                     |  |
| 18. Molding Devices—Presses—Heating and Vulcanizing—Tire Repairing. |  | 49. Processes — Vulcanizable Gums.            |  |
| 1,052,430   |  | 924,584                                       |  |
| 1,104,722   |  | 50. Processes — Vulcanizable Gums—Caoutchouc. |  |
| 29. Molding Devices—Casting—Rollers.                                |  | 910,520                                       |  |
| 968,175   |  | 935,414                                       |  |
| 34. Molding Devices—Molds.  |  | 1,003,244                                     |  |
| 1,139,699   |  | 1,248,888                                     |  |
| 35. Molding Devices—Molds—Sheet Shaping.                            |  | 51. Processes—Pyroxylin.                      |  |
| 925,468   |  | 1,124,691                                     |  |
| 47. Molding Devices—Molds—Materials.                                |  | 52. Processes—Restoring Caoutchouc.           |  |
| 1,200,138   |  | 921,148                                       |  |
| 47.5 Processes—Combined.  |  | 951,811                                       |  |
| 911,547   |  | 953,094                                       |  |
| 1,018,458   |  | 53. Processes — Vulcanizing Caoutchouc.       |  |
| 1,048,342   |  | Re: 13,667                                    |  |
| 1,116,979   |  | 1,089,482                                     |  |
| 1,126,659   |  | 54. Processes—Filament Forming.               |  |
| 1,128,747   |  | 962,769                                       |  |
| 1,350,825   |  | 1,022,097                                     |  |
|   |  | 1,028,748                                     |  |
|   |  | 1,030,251                                     |  |
|   |  | 1,034,235                                     |  |
|   |  | 1,062,106                                     |  |
|   |  | 1,066,785                                     |  |
|   |  | 1,073,891                                     |  |
|   |  | 1,102,237                                     |  |
|   |  | 1,106,077                                     |  |
|   |  | 1,121,903                                     |  |
|   |  | 1,200,774                                     |  |
|   |  | 1,383,742                                     |  |
|   |  | 1,414,070                                     |  |
|   |  | 1,414,076                                     |  |
|   |  | 1,428,246                                     |  |
|   |  | 55. Processes—Molding.                        |  |
|   |  | 1,027,004                                     |  |
|   |  | 56. Processes — Molding — Sheets.             |  |
|   |  | 961,696                                       |  |
|   |  | 59. Processes — Molding —                     |  |
|   |  | 966,372                                       |  |
|   |  | 1,099,598                                     |  |
|   |  | 1,114,006                                     |  |

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# Fashion Calls for Fans

Pyroxylin handles provide new outlet for designers' fancy



*Fan by courtesy of E. Eismann & Co.*

**W**OMEN'S styles this season seem to be calling upon the plastic industry for many items and ostrich feather fans with pyroxylin handles are one of the things that serve to make milady's toilet complete. Particularly large fans are most desired and those with vivid colors are being shown by the most exclusive and fashionable stores.

This photograph shows a professional model using a very beautiful ostrich fan with what is called by the manufacturer an amberoid handle. This handle is made of pyroxylin plastics in various colors and shades. Some of the tints most in demand are shell, amber, ivory, orange, red, blue and green.

As an added incentive for the continuous use of such a fan a practical feature has been added in the form of a small oval mirror.

In most cases the ostrich feathers are tinted the same color as the handle but some very beautiful fans have contrasting feathers.

## Robert June Organization Controls New Business

The Robert June Engineering Management Organization of Detroit has acquired control of the Electric Flow Meter Co. at Kansas City, Mo., formerly the Hyperbo-Electric Flow Meter Co. of Chicago, and will henceforth operate the business under its own management with executive offices at 8835 Linwood Ave., Detroit, Michigan.

Robert June becomes President of the Company, J. M. Naiman, formerly General Manager becomes Vice President, Consulting and Chief Engineer with Major W. W. Burden of the Robert June Organization as Treasurer.

## Phenol Resins Prove Versatility at Chemical and Radio Shows

Exhibits attract considerable popular attention

The Bakelite Corporation had large booths at the Radio Show and the Chemical Exposition, both of which were held within a few weeks of each other at the Grand Central Palace on Lexington Ave., in New York City. Besides innumerable molded parts on the non-transparent and more utilitarian type, there was also an exquisite exhibit of very beautiful art objects, enclosed in a large glass case which was the chief attraction for the ladies that visited the shows.

Transparent amber, deep green emerald tints and highly

ornamented articles of jewelry and adornment, all made of Bakelite were shown. Pendants, amber beads, cigarette tips and cases, in lustrous shades and colors, and a toilet and manicure set of deep rose transparent Bakelite were some of the more striking objects in this case.

Most of these parts were, however, not molded but were cut from the hardened, transparent resin. For the present, the molding of transparent Bakelite parts is still in the experimental stages.



# When Pyroxylin Plastics Burn

Immediate action and sudden cooling  
are chief requisites for fighting fires

By George E. Ferguson

Chemist, Pyrene Manufacturing Company

**T**HE tremendous growth of the celluloid and allied industries and the many uses to which their products have been put since John W. Hyatt first started his investigations in 1863 has not only been a development of very necessary and indispensable commodities but a corresponding development of a very hazardous and peculiar fire risk.

Celluloid, having incorporated within itself all the necessary elements which will both ignite and support combustion, cannot be handled while burning, in the way usually prescribed for ordinary fires. Its treatment is more in line with that recommended for "nitrate fires" or "chlorate fires" yet it differs in considerable degree from these.

If a wad of celluloid, such as a roll of film, be ignited and the decomposition be permitted to continue until the fire has become embedded to the extent of a quarter inch or more into the reel, the whole mass may be submerged in a pail of water without arresting the combustion.

Extensive experimenting on celluloid fires apparently has established one law, which so far has defied exception — stop the fire at the very start or else you will not stop it at all.

If this law is true then the field of fire extinguishing materials is considerably limited and the methods of application become extremely important.

## Carries Its Own Oxygen

In the first place, as has been stated before, in celluloid we find everything necessary to start and maintain combustion except the agency to raise the temperature of the celluloid to the kindling point. It is obvious therefore that we cannot smother the fire because it supplies its own oxygen. We cannot remove the burnable substance from the oxygen because the two are in molecular union. We can demonstrate that water or quenching action is of no avail; this leaves but one path open; lower the temperature of the burning celluloid below that point at which it kindles. This can be ac-

complished, and this principle is made use of in moving picture machines where the small thin strip of film is passed between the large sets of steel rollers; should the film become ignited, the fire can only extend to the steel rollers where the temperature is immediately lowered and insufficient energy, in the form of heat, remains to continue the decomposition. A volatile substance will always cool surrounding materials more quickly than a so called non-volatile substance. Alcohol or ether, poured upon the skin, or menthol or camphor rubbed upon the lips, are notable examples of the cooling action of volatile substances. This principle can be made use of in extinguishing fires such as are produced when celluloid burns.

A highly volatile, non inflammable substance containing nothing to support combustion, when quickly applied to an incipient celluloid fire will cool the burning celluloid to a temperature below its kindling point. Probably one of the best liquids on the market today for such an action is that sold under the trade name of "Pyrene."

(Cont. on page 66)



Needless destruction might have been avoided here by the proper preventive measures. This photograph shows the smoldering ruins of a half million dollar blaze wherein every available piece of fire fighting apparatus was brought into play on the fire before it was subdued.



# The Protective Power of a Good Trade Mark

The Bakelite Corporation adopt mark symbolic of the myriad uses of their product

By A. C. Tate

**A**LTHOUGH the word "Bakelite" itself is a trade mark and trade name already world-famous, the Bakelite Corporation nevertheless desired a distinctive trade mark that would, by virtue of its use with every article made of at least a part of their product, proclaim to the world the countless uses to which this synthetic product could be put.

Their slogan, "Bakelite—the Material of a Thousand Uses," adequately described the conditions as existing at the time when Bakelite first began to become popular; but in recent years the uses, new and old, have multiplied to such an extent that a mere thousand would hardly be a correct statement. There is hardly a field in which Bakelite can not find application, and the utility of this master-product of chemical investigation is proving itself to the industrial world in countless ways.

## Recent Registrations

In accordance with this new condition, the Bakelite Corporation has had evolved for them a new and striking trade-mark, for which applications were filed on July 3d, 1925, under serial number 216813, and 216815 (see U. S. Patent Office Gazette, August 25, 1925, p. 755). The Bakelite Corporation claims use of the new trade mark as of December 1st, 1924.

The mark itself consists of the letter B, in Gothic type, with the mathematical sign for "infinity" directly beneath it, the whole being surrounded by a boundary produced by uniting three semi-circles. Thus the "infinite" number of uses that Bakelite now enjoys is symbolized and there is no doubt that

this trade mark will soon be as well known as that of any product of world-wide distribution.

A few of the uses of Bakelite are described by the Bakelite Corporation in their appli-



**BAKELITE**

TRADE MARK REG. U. S. PAT. OFF.

The Bakelite Trade Mark

cation for this trade mark, namely:

Radium plaques, Ozonizing Apparatus, Violet-ray generators, X-Ray screens, manicure sets, handles of dental and surgical instruments, grinding wheels of dental instruments, teething rings and artificial teeth, candlesticks, lamp stands, bases and uprights, lamp shades, pendants and pulls, automobile trouble-light covers, porthole lights and steam radiator valve handles—surely a sufficiently diversified list to please any taste.

On April 11th, 1925, the same trade mark was applied for in connection with still other uses (Trade mark application serials 212525 and 212526, U. S. Patent Office Gazette, September 1st, 1925, p. 19) to wit:

Fountain pens, pencils, pen barrels, inkstands, letter trays, paper weights, loose-leaf binders, rules, rubber-stamps, handles, calendar stands, letter openers, paper cutters, penholders and pen trays; meter frames, discs and cases; ammeter cases, speedometer parts, wheatstone bridges, capacitance meter parts, flow-meter parts, stirring rods, pipettes, burettes and burette stands, graduates, watch glasses,

crucible beakers, gauge glasses, photographer's trays, camera cases, goggles, color screens, microscope stages and lens frames, lenses, ray filters, spectacle frames, reading-glass handles and frames, T-squares, rules, angles, curves, triangular scales, section liners, centrolines and protractors.

On July 3d, (Trade mark appl. 216816, U. S. Pat. Off. Gaz. Sept. 1, 1925, p. 33):

Cash boxes, instrument cases, vanity boxes, safety razor boxes, rouge and paste boxes and waste-paper baskets.

On July 17th (T. M. Appl. 217496; U. S. Pat. Off. Gaz. Sep. 1, 1925, p. 38:) pistol grips and butt plates.

On April 11, 1925 (U. S. Pat. Off. Gaz. Aug. 18, 1925, p. 491): Knife handles, saw handles, gears, gear-shift balls, dash-pots, lathe hand-wheels, anti-friction bearings, typewriter parts, tool handles, paperhanger's seam rollers, vending-machine parts, adding machine parts, calculator parts, check-protector parts, fire extinguisher shells, fruit knives, orange-peelers, type plates for printing on paper, cloth or other fabrics. (T. M. Appl. 212531).

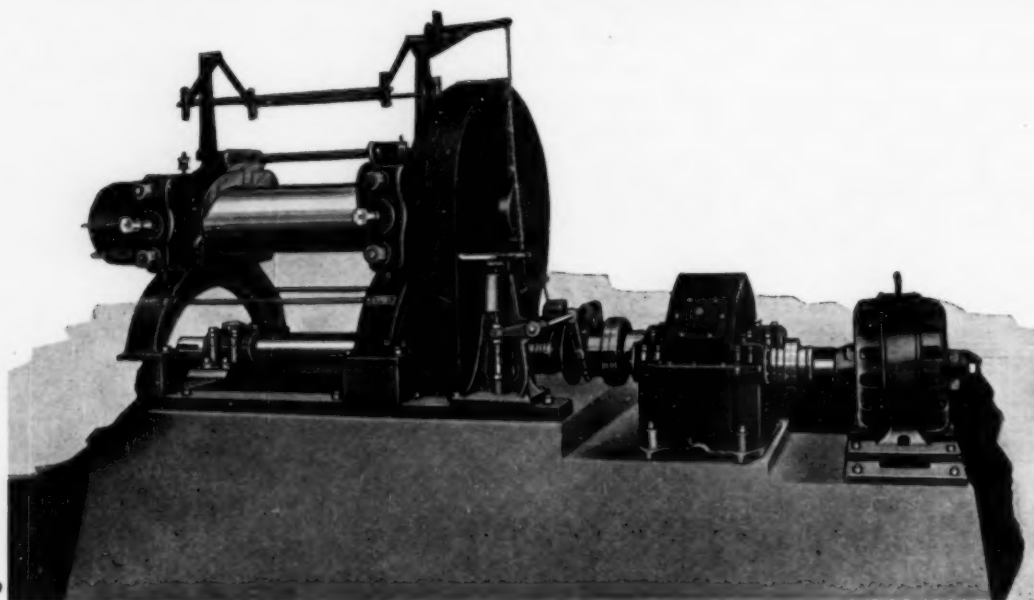
On April 25, 1925 (T. M. Appl. 213275. U. S. Pat. Gaz. Aug. 18, p. 493): Paint, enamels, lacquerers and varnishes.

Thus, it will be seen, Bakelite finds application in every field of human endeavor, from submarine to airplane, and from scientific instruments to waste-paper baskets. Infinity is right!

**"The Manufacture  
of Celluloid"**

By Evarts G. Loomis

in December PLASTICS



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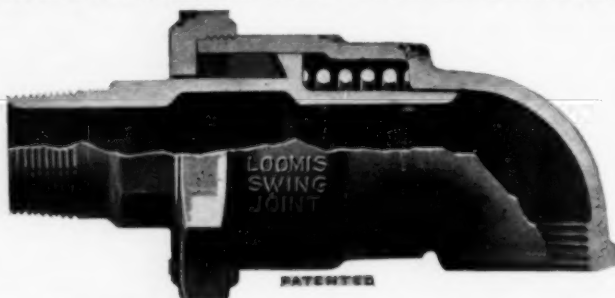
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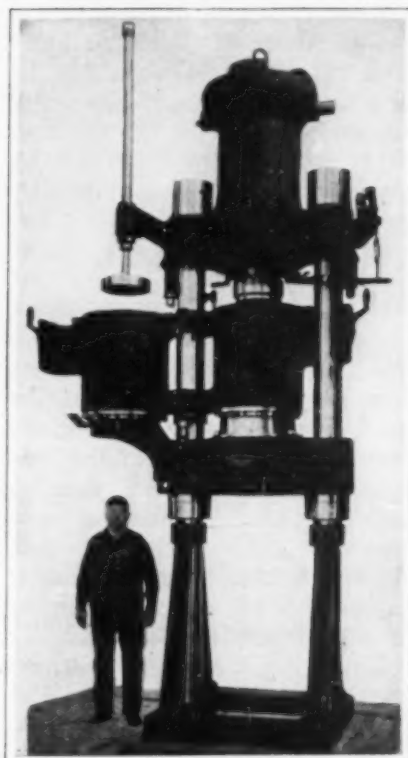
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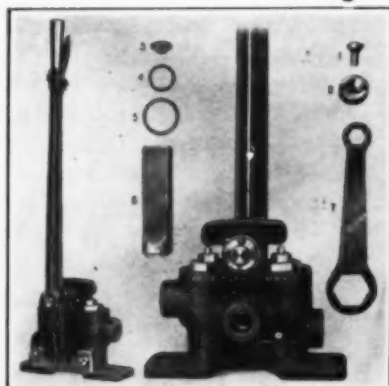
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## EDITORIAL · IMPRESSIONS

### *Tell us what is New!*

**T**HE value of any trade publication is directly proportional to the cooperation it receives from those whom it is intended to benefit. It provides a medium of exchange of ideas, of the airing of grievances, a getting-together and the promotion of the esprit-de-corps that is such an important factor in raising some industries to the heights that they occupy.

The Plastics Industry, properly speaking, is perhaps an old one; but in the modern sense it is still young. Years ago about the only real plastic materials worked by artificers were the ceramic materials, which required long drying and burning to give them final form. The rapid production of molded parts which allow of mass production and great fidelity in reproducing detail is hardly more than fifty years old. It had its first great impetus in the perfection of the pyroxylin plastics during the early seventies.

We take this opportunity to thank all of our friends who so

kindly gave of their valuable time to compose articles for the benefit of our readers; and we sincerely hope that the example they set will be followed by many others. The constructive aid of its readers is one of the main-springs that keeps a trade publication alive and interesting. There is a good story in almost every angle of the Plastics Industry. So very little has been written on this subject in the past, in our country, especially from the view-point of the fabricator and consumer, and regarding the mechanical and operative details, that our editorial problem should consist mainly of finding room for all of the contributed material.

So if you know of something that you believe is new, or odd, or interesting, let us have it; and let your fellow members in this rising industry know that you are alive and doing. To paraphrase a recent movie-subtitle "Cast your bread on the water and it shall come back sandwiches".

### *The Plagiarizing of Designs*

**E**VERY originator of things new and artistic naturally desires to reap the benefits and emoluments accruing to him as the result of his creative efforts. Many designers depend upon the protection afforded by the patent law covering designs. In the Plastics Trade, however, and especially in that branch covering the pyroxylin materials, there has been for some years past a lamentable condition arising from the fact that the designs of some of the pioneer concerns were almost immediately copied to the last degree by competitors.

This in an unfortunate state of affairs. The nature of Py-

roxylin Plastics is such that many of the designs could not be protected by design patents, as they often consist merely in combinations of colors and effects; methods of boxing, displaying and the like.

That this condition is plainly recognized by the trade is evident from the fact that the Pyroxylin Fabricators Association has taken up the matter with a view toward overcoming the condition. Its efforts should be crowned with success, as only then will true competition, based on merit, be possible.

### *Recent Shows*

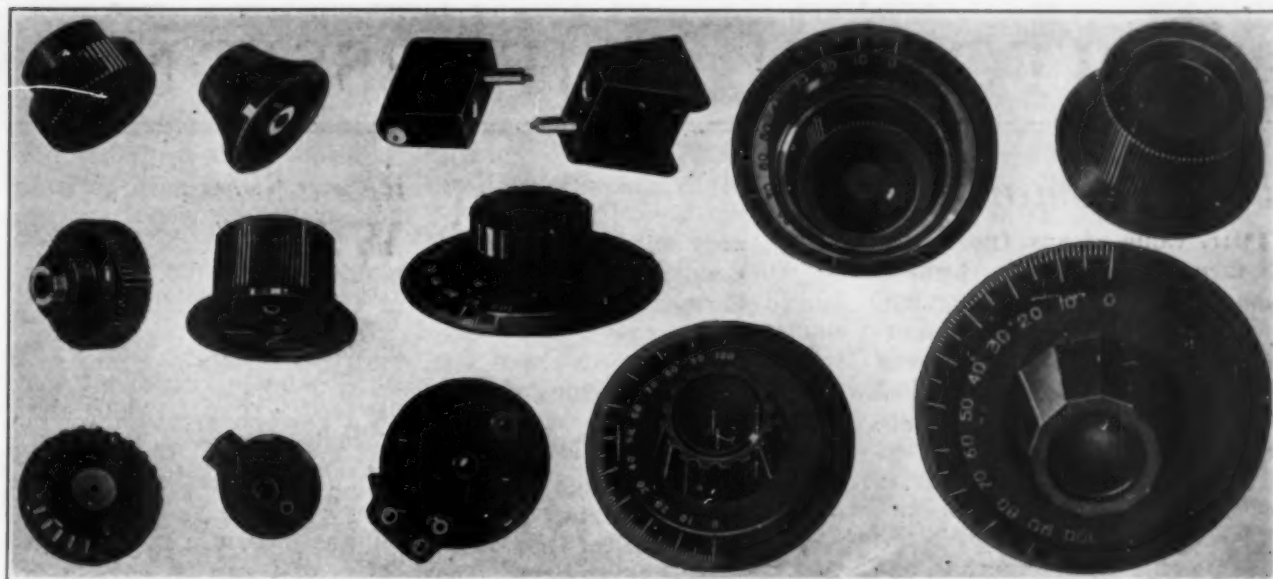
**W**ITHIN the past six weeks four annual shows or exhibitions have been held in New York, and in each of them Plastic material played a highly important part. First came the two radio shows, which were held simultaneously, followed by the Chemical Exposition and the Electrical show. The tremendous possibilities for the use of plastic materials in the radio industry must have been evident to every visitor to the exhibitions, and several of the larger manufacturers of plastic materials had extensive and instructive booths, not only for the furtherance of their sales to the manufacturers and jobbers, but also for the education of the general public. Whereas a few years ago it is doubtful if the average man of the street knew the name of a single plastic material, there are at present at least ten well-known makes that have become household words, at least among the rising generation that appears to take such a hearty interest in that which is new and striking.

As with few exceptions all of the modern plastic materials are products not found as such in nature, shellac being the most notable exception, and are the results of chemical investigation, the Chemical Exposition which just closed had a goodly number of exhibits of plastic materials, their uses and preparation. Some of the larger manufacturers of phenol-resins and molded materials exhibited both at the radio and the chemical shows.

The Electrical show, which was held in the same building as the two preceding shows, again demonstrated the universal applicability of the synthetic plastics, and several of the manufacturers who exhibited at this show were represented in the other three as well.

PLASTICS





*Some specimens of the almost endless variety of radio parts made of plastic materials.*

## Radio Presents Limitless Possibilities

Without molded products, the modern receiver would be almost an impossibility

*By Carl Marx*

The recently concluded Radio exhibitions, the Radio show at the Grand Central Palace, and the Radio Worlds Fair at the 258th Field Artillery Armory, at New York City, gave ample opportunity to the observant to see for himself the very important part that plastic materials play in this newest and most rapidly developing industry.

Only a few years ago when Radio was still universally called Wireless and had not as yet caught the public's fancy, most of the apparatus was made by but a few companies and the total consumption of plastic materials for panels and the like was very small. The parts were mostly made by the larger electric companies who had entered the field in a small way. It was not until the formation of the Radio Corporation and the sudden overwhelming tide of popularity which followed the Westinghouse Electric & Manufacturing Company's inauguration of broadcasting from the now world-famous KDKA at

Pittsburgh, Pa., that Radio as a popular hobby began.

The demand that arose as the result of the first onslaughts of the home builders and experimenters gave rise to a great number of smaller manufacturers, most of which would concentrate upon some easily made article and turn it out in quantity. The first demand was for coils and variable condensers.

### The First Demand

The coils for the most part, and in the early days, were wound on cardboard tubing, but the decided disadvantages of this material soon caused a widespread demand for tubing impregnated with some dielectric material, and as the most available and suitable material for the purpose, the phenol-formaldehyde resins, as Bakelite and its congeners, were seized upon. These almost immediately replaced the paraffined and bituminized tubes and in a short time there was hardly a set or part made that did not claim as one of its chief

advantages the presence of some Plastic material or artificial resin.

The condensers first offered to the general home set-builder consisted of metallic plates and almost invariably had some molded end-pieces of dielectric material. The earlier manufacturers, in the haste to get into production, adopted such available plastic materials as shellac and resin-base molded goods, with the result that thousands of condensers were palmed off on the public with ends that soon warped and twisted and sagged, so that many sets soon became inoperative due to the short-circuiting of the condensers. This was due to the use of materials of too low melting point, "molded mud" as some fans used to call it. This would soften due to the heat of the electron tubes and become hopelessly distorted.

Shortly after, or about the second year of popular radio (about 1921), condensers with genuine phenol-resin endpieces

began to appear and this difficulty disappeared. It now looked as though the ideal condition had been found and many condenser manufacturers put up molding equipment to make their own condenser and coil mountings. Then came the next "era," popularly known as the "low-loss" craze, when all end-pieces and mountings of dielectric material were shunned by the constructors as though possessed of a plague, and those who had spent so much money on equipment for molding coil mountings and the like were left stranded with inutile equipment.

However, what was lost in one field, was gained in another, and plastic materials then began to be used for the short insulating cross pieces on the condensers, and as in this case the dielectric constant of the material was about right, many manufacturers definitely advertised that they were using some popular brand of phenol-resin. Bakelite, Isolantite, Redmanol and similar products, some with rather fancy sounding names, became popular.

While the earlier home-built sets were usually mounted on a flat board with wires running all over the set in a maze, the demand for better appearance led to the almost universal adoption of the vertical or sloping panel

type, with the set housed in a cabinet of some sort. This immediately led to a tremendous demand for panels, and it is quite safe to say that for this use the Plastic Materials offered to the public has almost always been of the best type. Much controversy arose as to the best type of panel and the manufacturers outdid themselves in claims as to dielectric strength, phase loss, mechanical strength and the like in their advertising claims.

#### Consumption is Enormous

Hard rubber, Bakelite, Celeron, Formica, Micarta, and Dilecto were some of the more popular panel materials. The present consumption of laminated phenol-resin panels is enormous and there appears to be no diminution in demand, as most sets now manufactured are equipped with some sort of plastic material panel.

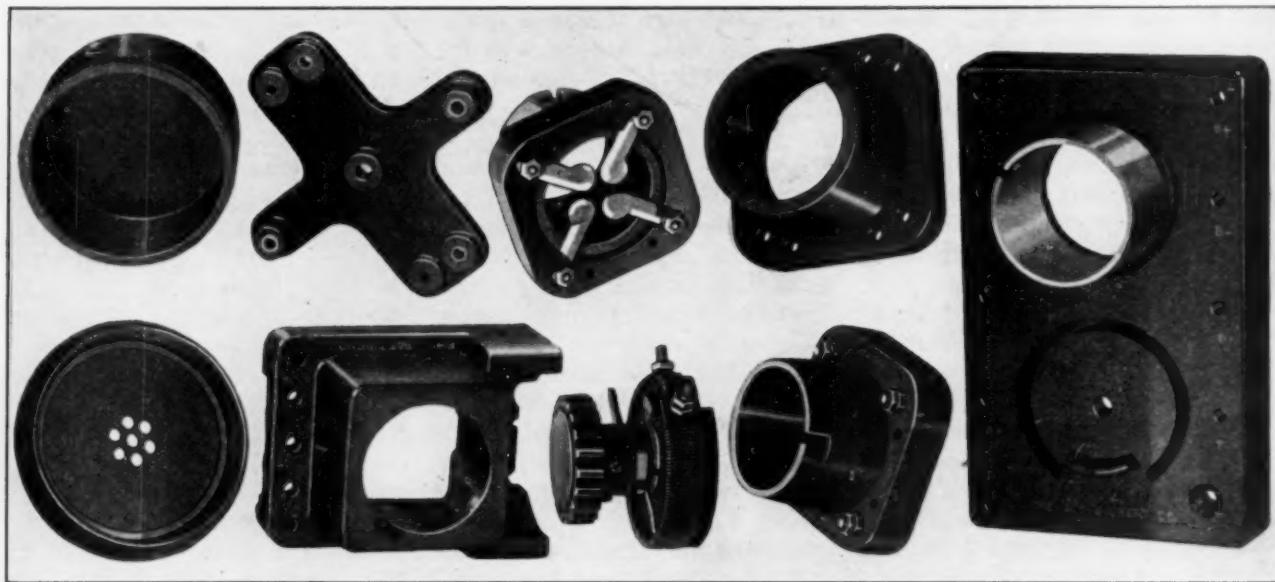
Lately there was a tendency for the adoption of metallic panels, and some manufacturers feared that these would replace the plastic panels, but at this writing this has not as yet occurred.

In addition to the synthetic resins, certain manufacturers of rubber goods put out hard-rubber panels and one large manufacturer of pyroxylin products

came to the front with a stiff but flexible pyroxylin panel which appeared to have all of the virtues and none of the defects of the others; at least so it was claimed. While at first finished in black, colors such as imitation mahogany next appeared and the latest departure is the highly ornamented panel shown at the recent exhibitions.

One set in particular had a most beautifully designed panel made of phenol-resin, decorated by a new photographic process which gave it the effect of Japanese lacquer work or gold-inlay. Not only did this panel eliminate the use of dials as the scale divisions were photoengraved with absolute precision upon the panel itself, but all the arrows and other informative markers were likewise part of the design. The effect was striking. The tendency at present appears to be away from the graduated dial in favor of a graduated or scaled panel with a hand or pointer. In some ways this is a revival, as an examination of some of the old sets dating back to 1905-1910 shown at the exhibition, reveals the fact that the early sets were thus provided with pointers.

This method of decorating the panels gives unlimited scope to the designer, and there is no  
(Continued on page 66)



*Intricacy of shape presents no fabrication difficulties when plastics are used*

# Corncob Furfural for Synthetic Resins

Properties and uses of aromatic aldehyde that may replace formaldehyde in condensation products

By F. B. LaForge  
United States Bureau of Chemistry

**F**URFURAL,  $C_4H_3O.CHO$ , is an aromatic liquid aldehyde, melting point,  $36.5^\circ C.$ , boiling point  $161.7^\circ C.$ , density  $20^\circ/4^\circ$ —1.16. It is nearly colorless when first prepared but darkens on exposure to air and light. It is completely miscible with the common organic solvents excepting petroleum ether, gasoline, kerosene, and glycerin. The solubility of furfural in water at  $20^\circ C.$  is 8.3%, and that of water in furfural at  $20^\circ C.$  is 4.8% by weight of the solution.

Research by chemists of the Bureau of Chemistry, U. S. Department of Agriculture, on the production of furfural has resulted in the development of a cheap and simple process for its manufacture from corncobs.

## Method of Manufacture

In brief the process consists in digesting the cobs with steam at about 135 lbs. pressure for approximately 2 hours, while distilling off slowly the furfural formed and collecting it as a dilute aqueous solution. The latter is put through a column still provided with continuous decantation in order to separate the furfural in the form of a 95 per cent solution. Just enough sulfuric acid (about 0.75 per cent of the weight of cobs) is added with the charge to neutralize the bases present, and water is added in such quantity that with condensed steam the water-cob ratio 30 minutes after digestion begins will be about 4:1. At the end of the digestion the digester contents are discharged, drained, washed, and pressed to separate the cellulosic residue and liquor. The liquor contains some furfural which is recovered as a weak solution to be

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*One of the features of the "Court of Chemical Achievement" at the Chemical Exposition was an exhibit of furfural and its multitudinous derivatives.*

*This material, a byproduct from corncobs and oat meal hulls, was a chemical curiosity but a few years ago, but now can be manufactured cheaply and in quantity.*

---

used in subsequent digester charges.

At the experimental plant for furfural manufacture installed at the Color Laboratory, Arlington Farm, Virginia, a yield of furfural equal to 9 per cent of the air-dry weight of cobs (180 lbs. per ton) has been consistently obtained using this process.

Using data obtained in the operation of the Bureau experimental plant, it is estimated that by the process described furfural may be produced on a large scale (e.g. 50 tons of cobs per day equal to 4.5 tons of furfural) at a cost of about 6 cents per lb. This estimate makes no allowance for possible income from by-products of the process.

A very promising field has been opened for the use of furfural in the manufacture of resins suitable for electrical instrument parts, printing plates, and various molded articles.

U. S. Patent No. 1,331,485 has been issued on the use of furfural in removing paint and varnish.

Furfural is an excellent solvent and gelatinizing agent for both nitrocellulose and cellulose acetate. It is also a solvent for most of the varnish gums and resins. Furfural is

completely miscible with acetone, benzene, alcohol, and china wood oil, partially miscible with turpentine and linseed oil, but practically immiscible with gasoline. The vapor pressure of furfural is very low, being 10 mm. up to  $40^\circ C.$  The foregoing properties give furfural promise as a solvent in the paint and varnish industry, especially in the manufacture of lacquers, although its tendency to darken would probably confine its use to the darker products. A number of varnish manufacturers are now conducting investigations in this field.

Furfural is a combustible but not particularly flammable liquid which burns slowly with a luminous flame. The flash point of furfural containing water is reported at about  $56^\circ C.$  and that of a highly purified material as over  $100^\circ C.$

## Will Become Cheaper

Since further improvements in the process of furfural manufacture will likely reduce the price, the use of furfural as a fuel becomes a possibility for the future, but is not immediately practicable in this country.

Furfural is reported to be giving promising results as a fungicide, germicide, and preservative, but details of this work are not available.

Furfuramide and furfurine, derivatives of furfural, have given some promise as vulcanization accelerators in the rubber industry.

See December PLASTICS  
for "The Fabrication of  
Dressing Combs"

By L. B. Kavanagh



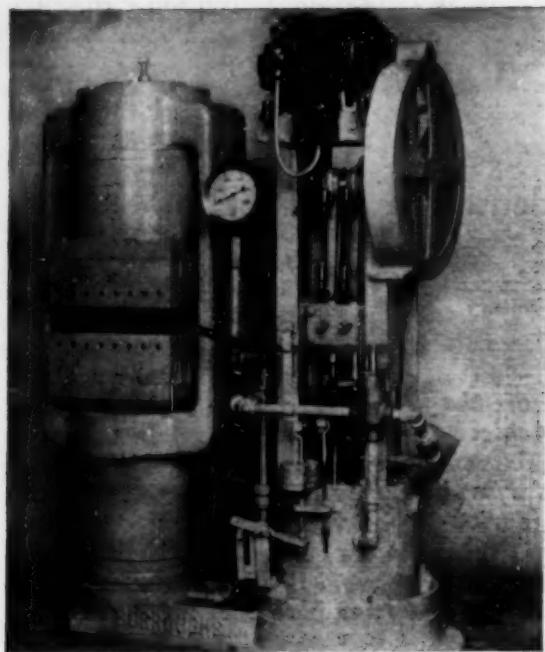


FIGURE 5

### Jimmy Goes Into the Molding Business

(Continued from page 47)

From this it will be seen that the pump and Accumulator are entirely automatic in their action. It is essential that the pump be of sufficient capacity to prevent the Accumulator reaching bottom with a consequent drop in pressure, (in case a number of presses are operated at the same period.)

Figure No. 5, illustrates a complete Self-contained Hand Molding Unit, consisting of a press, high and low pressure motor driven pump and weighted pressure regulator embodying all the features of an accumulator and pump system, with the advantage that no piping connections are necessary and the Unit can be set in the most desirable location without regard to supply lines.

The pump has its supply of water in the tank base, the pressure regulator can be adjusted to the required pressure and when the press is equipped with electrically headed platens the whole outfit can be run from a 220 volt light socket. The operation of this unit is as follows:

The mold is placed in the press and the valve closed causing the

pump to deliver its supply to the press. The slack or gap between the press platen and top of mold is quickly taken up by the combined discharge of the high and low pressure pistons. When contact is made between the mold and top platen of the press the low pressure piston ceases to deliver at a predetermined low pressure and the high pressure piston continues to supply high pressure until a predetermined pressure is reached

which causes the pressure regulator to function cutting off the supply of high pressure water. The pump meanwhile runs idle (no discharge) and the pressure regulator maintains the desired high pressure until the molding period has been completed. If for any reason due to leakage or otherwise, there should be a drop in pressure, the pump automatically comes into action and maintains the desired pressure.

At some future date we shall describe Semi-Automatic Presses or different types used for large quantity production of molded parts, molds of all types, and die hubbing.

## Beef Blood as Horn Substitute

(Continued from page 48)

fine polish. It is quite acid resistant.

By the use of various fillers, such as paper pulp, wood ashes, and the like, the cost of the product can not only be lowered but its tensile strength considerably increased. The addition of castor oil will increase the flexibility, but at the expense of some of the polishing qualities.

In place of the phenol above mentioned, a borax solution of casein can be employed, but in this case the addition of castor oil becomes imperative. If prior to the main operations already outlined, the blood serum has first been treated carefully with some metallic salts, and the hardening effect is produced by the use of formaldehyde, the product will be quite resistant to moisture and so hard that it will take a lustre comparable to polished glass.

A second artificial horn product can be prepared by mixing 125 parts of gelatine dissolved in 125 parts of glycerol with 15 parts of sulfur, 20 parts of copper, 23 parts of colophony (rosin) and hardening the mass after an addition of 10 parts of sodium bichromate for 30 hours in a 20% solution of formaldehyde.

degrees C (212 deg. F). This continued heating in the presence of resins and sulfur and tanning agents or salts brings about a transformation of the constituents into a very excellent artificial horn product, one which can be adapted to many useful products.

Parkert states that an excellent casein plastic can be made by mixing technical casein with a 10% borax solution of shellac, with the addition of suitable coloring matter. If the plastic mass thus produced is subsequently hardened with formaldehyde, it will become very hard and capable of being highly polished. This material can be worked more readily than straight casein plastics and is considerably stronger and less brittle. Either aniline dyes or metallic salts may be used for imparting the desired color to the same, and if the salts also exert a hardening action, will produce some fine effects.

### COMING "The Measuring of Molding Powder"

By L. H. Bailey  
F. J. Stokes Machinery Co.

## Will Advertising Sell Combs

(Continued from page 49)

which each dealer stores and displays his supply of combs, helps the retailer and the company. The case is put on the dealer's counter and gets the product before the consumer. The fact that the product is not spread out on a counter for indiscriminate handling has a pleasing effect on the customer from a sanitary standpoint. (In this connection it should be mentioned that each comb is packed in an individual sanitary wrapper.) The display case has an advertising value, a convenience value and a sanitary value. For these reasons it is a profit maker for both the retailer and the advertiser.

About two years have passed since this company started on its consumer advertising campaign. It has felt the results of this advertising, not only on its line of combs, the only product which it advertised, but on practically all of its other products.

## Toilet Ware Problems

(Continued from page 45)

mitting temporary conditions to motivate them into practices and prices of permanent harmful effect, a determination not to sell goods below cost, cost to be correctly arrived at, and cooperation by all the manufacturers for the purposes of discussion of common problems in an association—all these will help in the solution of our difficulties.

The Toilet Ware Division of the Pyroxylin Fabricators Association is in being and is functioning, and manufacturers with a real interest in the welfare of their industry should join and take part. Unorganized each one of us bears the full weight of our problems. Organized our share is only a proportionate part of the whole.

Miss Mira Mack is now toilet goods buyer for the Nichols & Frost Co., of Fitchburg, Mass.

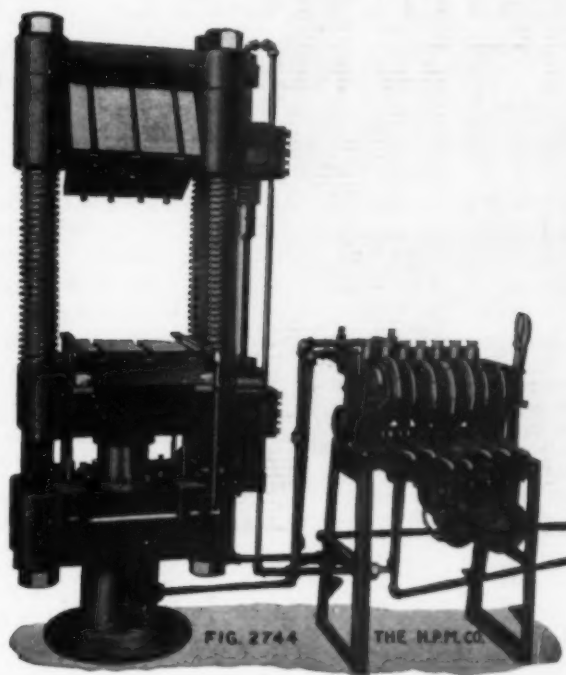


Fig. 2744—Automatic Thermo-Plastic Molding  
Presses for Bakelite, Celluloid, etc.

## A 16-Year Old Boy Will Produce Perfect Parts With H-P-M Plastic Moulding Presses

And this same boy can easily serve two presses throughout the working day.

H-P-M Automatic Moulding Presses cut the cost of moulding to an absolute minimum.

The Automatic and accurate timing mechanism absolutely eliminates defective parts.

Our engineers are at your service and will show you a type and size of press for your particular need.

THE HYDRAULIC PRESS MFG. CO.

H-P-M Presses pay for themselves quickly  
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# TECHNICAL ABSTRACTS AND PATENT REVIEW

## PLASTIC COMPOSITION FROM CELLULOSE ACETATE. Camille

Dreyfus. English Pat. 215823, Feb. 14, 1923; application No. 4332, 1923. Class 70.

Organic cellulose derivatives, such as cellulose acetate or cellulose ethers and the like, are melted at or about atmospheric pressure with one or more plasticizing agents, and with or without resins, dyes, fillers, etc.; the melt is allowed to solidify and is then ground into a powder. The powder, with or without further working upon heated rolls, and with or without further additions, is molded under heat to form sound records, electric insulators, and other forms of molded products.

According to a specific example, 100 parts of cellulose acetate and 45 to 55 parts of para-toluene sulfonamide are melted in a pot and the mass run into slabs, allowed to solidify and then ground.

180 to 200 parts of filler material, such as a mixture of lamp-black, red iron oxide and barytes are added and the mixture worked upon heated rolls until uniform, as is the regular practice in phonograph record production. The material thus produced is then molded in the usual manner into phonograph records or the like.

In other examples, in place of the para-toluene sulfonamide above mentioned, the plasticizers covered by English Patent specifications 132283, 133353 and 154334 are employed. Specifications 174660 and 179208 (English) are referred to as well. (This is believed to cover the product called "Moldite").

## DYEING CELLULOSE ACETATE.

U. S. P. 1,549,906, Aug. 18, 1925.

Rene Clavel, Switzerland.

Cellulose acetate, either in the form of artificial silk, or any other form, is dyed by so-called "ice-colors" which are developed upon the fiber. The present invention covers the addition of inorganic salts, especially magnesium chloride to the dye bath, and the addition of protective colloids such as gelatine, gelatine soaps, soaps, boiled-off liquor, etc., to the developing bath. Specific formulae and dye-stuffs are given. Claim: "Process of dyeing cellulose acetate in artificial silk, film or other form, with developing dyes, comprising applying at least one of the components to be coupled in the presence of soluble chloride and protective colloid." There are 2 claims.

## ARTIFICIAL SILK AND OTHER PRODUCTS FROM CELLULOSE ESTERS. U. S. P. 1,551,791, Sept. 1, 1925.

Emile Bindschedler and George Juer, assignors to Tubize Artificial Silk Co., of America.

Artificial silk and other articles of cellulose esters are made by dissolving a cellulose ester, as cellulose acetate, in acetone and spinning or otherwise forming the material into the desired shape. The excess acetone remaining in the material is removed and recovered by immersing the product in a concentrated solution of calcium chloride. Cellulose nitrate may be used in conjunction with the cellulose acetate.

## MULTICOLORED CASEIN PLASTIC ARTICLES. Gaston Pasquier,

German Patent 366898, Sept. 7, 1920. Class 75-b.

Several thin sheets of different colored casein solid are superimposed and then deeply engraved so as to expose the bi-color effects, etc.

## PREPARING ARTICLES FROM IVORY NUT. Lucas Freres,

French Patent 537494.

100 parts of powdered ivory nut waste, 50 parts of magnesium silicate and 7 parts of casein are well mixed and then treated with 1 percent of a 10% solution of potassium bichromate, being kneaded until the mass is perfectly uniform. The material is then pressed at 350 kilograms per square centimeter (about 5000 lbs. per sq. inch) into a block from which, after drying, the articles are fashioned.

## INSULATING MATERIAL; PROCESS OF PREPARING INCOMBUSTIBLE. U. S. P. 1,552,201, Sept. 1, 1925.

Johannes J. Bergsma, Java.

The bark of any kind of tree, preferably that of the djatti tree, growing in India, is comminuted and mixed with inorganic or organic binders, molded, pressed and dried. Portland cement, molasses, brick dust and sand may be employed to produce a material suitable for building construction. Claim: "A process of preparing an incombustible and insulating material consisting in mixing pulverized bark of the djatti tree with a binding material and a filling substance." There are four claims.

## PAPER PRODUCT FOR MAKING LAMINATED INSULATING MATERIAL. PAPER PRODUCT CONTAINING ARTIFICIAL RESIN. U. S. P. 1,551,428, Aug. 25, 1925.

L. V. Redman and H. C. Cheetham, assignors to the Bakelite Corporation, New York, N. Y.

Paper containing a phenol-formaldehyde condensation product is prepared by beating the cotton or sulfite paper pulp with a phenol resin of the permanently fusible type, a methylene-containing hardening agent, preferably hexamethylenetetramine, and free phenol, during the manufacture of the paper so that the formation of the final infusible and insoluble phenol-aldehyde condensation product may be effected whenever a laminated final insulating material is to be made therefrom. A typical formula is: 450 lb. non-reactive phenol resin, 500 lbs. cotton or paper pulp (sulfite pulp), 7500 lbs. water, 375 lbs. commercial phenol, 240 lbs. hexamethylenetetramine. The resin is employed in the powdered form, at least 100 mesh. The addition of calcium stearate, as a "release material" is advocated. The paper is made in the usual manner, about 2/1000 inch thick. In the manufacture of laminated insulating material, such as radio panels, etc., the superposed sheets are consolidated by heat and pressure. The addition of furfural in amounts from 10 to 15 percent is claimed to render the material more plastic. There are 15 claims.

## SHOE FILLER. U. S. P. 1,551,546,

Sept. 1, 1925. John J. Daly, Newton, Mass.

A fusible binding material such as powdered gum or asphalt is mixed with fibrous material such as lint, hair, etc., to form a thermoplastic sheet. This is cut roughly to size, heated and applied to the interior of the shoe while still plastic. Claim: "Method of filling the sole space of a shoe consisting in forming a sheet of comminuted fibrous material having therein in an unfused state a fusible material, said filling material being compressible and self-conforming when said material is fused, in cutting from said sheet a blank of substantially the side of the sole cavity, in heating the blank and inserting it in the cavity and in compressing the blank in place while hot to cause it to spread and fill the entire sole space." 4 claims.



**PRINTING ON CELLULOID OR CASEIN PLASTICS.** *Kunststoffe*, 1925, 15, 99.

Pyroxylin and cellulose acetate plastics can be printed upon by ordinary methods. The only point of especial importance is to use proper materials, i. e. solvents, in the inks. The usual printing inks can be made suitable by the addition of either acetone, alcohol and camphor, or glacial acetic acid. The important point is not to use too much ink as it will spread. If necessary some talcum can be sprinkled on after printing. Steel, brass or "red-metal" type and cuts can be used. Quite often the material is printed in reverse on the back of transparent sheets of pyroxylin or cellulose acetate (Cellone), the method employed being the same as described.

To apply gold leaf or decorative leaf, the celluloid sheet is first rubbed over with alcohol and then sprinkled with powdered albumen. The leaf laid on and impressed with a die. Other artificial plastics, such as casein and phenol, can not be printed upon, but must be embossed for the best result.

**HORN-LIKE MASSES FROM CASEIN.** *Kunststoffe*, 1925, 15, 83.

Considerably greater tenacity can be imparted to casein plastics by the addition of sulfonated fatty acids, such as Turkey-red oil. For example there are kneaded together 100 parts of dry commercial casein, 3 parts of Turkey-red oil and 17 parts of water, using considerable pressure. The product is much more transparent and is not nearly as brittle as the other casein plastics.

**ACTION OF ZINC OXIDE ON THE STABILITY OF CELLULOID.**

Katsumoto Atsuki. *Journal of the Faculty of Engineering, Tokyo Imperial University*, 1925, 15, 303.

Zinc oxide increases the stability of celluloid made from non-stabilized cellulose nitrate, but actually decreases the stability of such celluloid as is made from stabilized cellulose nitrate. When 20% of zinc oxide are used, the stability is about normal, the Abel heat test being about 10 minutes and the ignition temperature 170°C. Celluloid containing zinc oxide becomes brittle after drying, due probably to a sort of catalytic effect. If the porosity of the celluloid is such that air can diffuse into it, but insufficient to allow the escape of the nitrogen oxides formed by decomposition, then the decomposition of the celluloid will be accelerated. If the nitrogen oxides can escape freely the decomposition will be correspondingly retarded. In general, zinc oxide, due to its neutralizing action upon the nitrogen acids resulting from the decomposition of celluloid will somewhat prolong its useful life.

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# W A L T E R H. B R O W N I N G N O R T H A R L I N G T O N J.

Representing  
**NIXON NITRATION  
WORKS**

(See Back Cover)

## Erinoid--Described and Defined

(Continued from page 48)

parts; magneto terminals, collector rings, levers, switches, button and pearl pushes, plugs and pegs, pushes and many other parts of mechanical and electrical apparatus. In the field of decorative electrical fittings it is unrivalled owing to the wide range of colors and the convenient form of supply. Particularly is it suitable for switch plates, and covers.

It is impossible in the space at command to give anything like an exhaustive list of the uses of Erinoid, but its scope may be indicated by saying that it is now being extensively used in the making of beads, brooches, boot and shoe buckles, buttons, jewelry and fancy ornaments, fountain pens, pencils, knitting pins, cigar and cigarette holders, chessmen, counters, dice, dominoes, Mahjong tiles, brush and mirror backs, combs, manicure sets, toilet sets, hair and hat pins, paper knives, pocket and fruit knife handles, scientific instruments, carving knife handles, knobs for furniture, finger plates, door handles and escutcheons, umbrella, parasol and walking stick handles, parts for musical instruments, piano keys, organ stops, labels of all kinds, and thousands of other uses.

### Color Effects Numerous

Erinoid is supplied to the manufacturer in the form of sheets in a wide range of thicknesses, Rods and Tubes of various diameters. The colors and color effects are very numerous, and it is possible to match any effect desired with but few exceptions. It may readily be cut, drilled, threaded, sawn and polished, and it can, to a certain extent be moulded. It can be furnished either opaque, perfectly transparent or with clouded or mottled effects. Being a nitrogenous product, it has many of the desirable properties of natural horn.

### The Improved ARROW Routing Machine

Manufactured By  
**Geo. Langenecker**  
524 15th Avenue  
Newark, New Jersey

### Specializing in tubes for Fountain Pens

### H. A. Cook Co.

Pyroxylin Products  
681 Main Street  
Belleville, New Jersey  
Phone Belleville 2182

One almost might be inclined to call it a natural product as the casein from which it is made is produced exclusively from the milk of the cow. Erinoid is another example of the ingenuity of man in taking such raw material as nature offers, improving upon them, and giving them universal utility.

### Shaw Insulator Co.

One of the noteworthy exhibits of plastic molded products at the Radio Show at Grand Central Palace was that of the Shaw Insulator Co., who showed a large and interesting exhibit of panels, dials, knobs, tube sockets and phone plugs; most of which were made from phenol-resins.

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## Lower the Temperature to Stop Pyroxylin Fires

*Continuing Mr. Ferguson's article from page 52*

It is obvious that success in extinguishing a celluloid fire, given the proper substance to apply, depends upon the speed of application, as well as the amount of extinguishing material applied.

Automatic extinguishers must be resorted to if celluloid is stored in large quantity, even though the bulk of the celluloid is segregated into small units separated from each other in compartments, etc. Time is the vital factor. The ordinary sprinkler head release is far too slow—depending as it does upon a rise of temperature of the atmosphere in which it rests, before it releases.

Some time ago, while working on this very problem in connection with the storage of reels in the magazine of a motion picture machine, this same problem was presented; the fire could be instantly extinguished if the material could only be applied immediately. This problem was solved and patent application was made. The idea briefly was a primer for the fuse link or plug. When celluloid burns, especially in the form of films, the blaze from a loose end of film is quite extensive, averaging from two to three inches in length and this property was utilized in igniting a small wad of gun-cotton attached to the fuse link or plug.

The system employed was very simple, consisting of a small tank containing Pyrene liquid maintained under a slight pressure of forty to fifty pounds, and having a distributing system of pipes emanating from the tank to the chamber in which the films were stored and so distributed that upon release of the liquid the pipes would direct several curtains of liquid, intersecting in such a manner

that the entire chamber was practically covered with the material.

The important feature of the device was the quick release of the material in the advent of fire. The pipe system was supplied with a master valve which controlled the flow of liquid from the tank. The master valve was locked with a fuse metal plug or seal and attached to the seal or plug was the primer in the form of gun cotton. As we all can appreciate, gun cotton will ignite very readily from a flame even though the flame is a considerable distance from it, and upon this fact the operation of the device depends. The tremendous heat of the burning gun cotton applied suddenly to the fuse metal actuates the valve and

releases the Pyrene. The success of the extinguisher rests entirely upon the speed of the application of the extinguishing agent, and it is noteworthy to call attention to the fact that the chamber containing the films has not changed in temperature more than a degree or two before the fire is extinguished.

In dealing with this particular problem of films, the details have more or less been disclosed in the hope that similar mechanisms may be produced to cope with special situations or risks.

In conclusion, therefore, it is well to sum up the important features of successfully coping with celluloid fires as follows:

A rather large amount of a volatile, non inflammable liquid which will not support combustion, an automatic device for application of the liquid, and a primer for releasing the automatic device. Speed of application of the extinguishing agent means the difference between success and failure.

## Radio's Limitless Possibilities

*(Continued from page 58)*

doubt but that this method may also be applicable to other uses than radio panels.

Another of the manifold uses for plastic materials is in the manufacture of the countless forms of dials and knobs used in such profusion upon the earlier radio sets. Although the present tendency is toward the simplification of control and the elimination of the multitudinous dials and handles, the dials now being put on the better grade of sets are almost universally made of the highest type of phenol-resin and exhibit a workmanship and finish that is a credit to the plastic molding trade. The popularity of vernier dials, or such as carry mechanical reducing gears within their interior, requires that the molded parts be made with a very high degree of accuracy.

Although the phenol-resins, retain their popularity for dial work, several very good shellac-base molded dials were shown at the recent exhibition, and these left nothing to be desired as to form and finish.

The bases of the audion or electron tubes used in all radio sets were at first made of metal, but there is hardly a tube on the market today that does not have a phenol-resin or at least some plastic material base. The ease of adopting such bases to mass production and the possibility of putting the manufacturers name indelibly into the base no doubt contributed to the adoption of these bases. They also greatly increase the attractiveness of the tube and also help its operating characteristics by the elimination of metal at a point

where it is not wanted. These bases are molded in one piece from phenol-resin material and are capable of mass production.

The rheostats for controlling the electron tubes were at first wound on some sort of vulcanized fiber, wood, or similar material, but at present the non-fusible phenol-resins are universally employed except in the very cheapest "gyp" goods.

#### 100 Types of Sockets

A tremendous amount of plastic materials is used in the construction of the tube sockets, there being over one hundred different types on the market. Lately this field is being invaded by porcelain and glass, but it is doubtful if these materials can compete in mass production with the resins which allow of molding and insertion of the metallic parts at one operation.

There is scarcely a single radio receiver in existence that does not include among its equipment one or more of the small fixed condensers, and the fabrication of these highly essential little units has assumed unheard of proportions. As a high degree of accuracy in molding these parts is required to assure a condenser of the correct value and one which will retain its rated capacity indefinitely, the manufacturers of the better grade of condensers adopted the phenol-resins as their base material. Many of these little condensers have genuine mica inserts but one of the largest electrical companies is using a plastic phenol-resin as an adhesive in building up layers of mica for dielectric purposes.

#### Wire, Wood and Plastics

This, however, by no means exhausts the possibilities of plastic materials to be of service in radio. Even wood may soon be discarded as several manufacturers have adopted molded plastic cases for their sets. Several years ago a well known maker of small portable one-tube sets encased the entire working parts of his outfit in



## STOKES Bakelite Measuring Machine



This machine will measure **Rapidly** and **Accurately** charges of Bakelite or other molding powder. Capacity 35 charges per minute up to 3 ounces in weight. Weight of charge easily adjusted.

We also manufacture a complete line of pre-forming presses.

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We specialize in grooving, Beveling, Trimming, Routing and other Cutters and Burs used in the manufacturing of toilet articles and similar lines.

Illustrated folder on Beveling Machines and Cutters sent on request.

These Machines are being used with success on bakelite and similar materials.

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make Knuckle Joint and Screw Presses for the same purpose.

Fig. 1 shows our Semi-Automatic Press, the mold remaining in the press for curing and chilling. Fig 2 shows the smaller sizes of presses when the molds are put in the press for curing and removed to the chilling press. We also make power pumps either for belt or for direct-motor drive, Accumulators, Operating Valves, Pressure Guages, etc. **Presses for Special Work Made to Order.** Our experience of more than fifty-five years is at your service.

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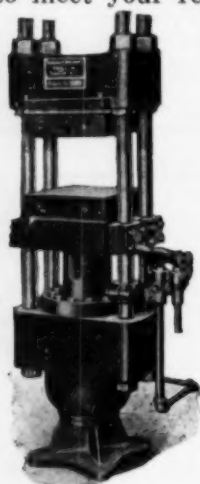


Fig. 2

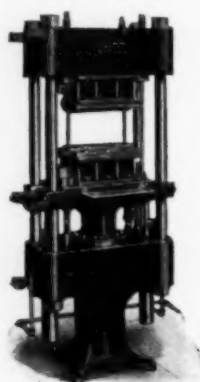


Fig. 1

a molded case, so that the possibility of a portable receiver made entirely of molded materials, with the metallic conductors permanently imbedded in non-conducting material appears to be among the possibilities.

The countless accessories of the radio industry provided another large outlet for a plastic materials and help to keep the die-maker and molder busy for a long time to come. The casings for the telephone headsets loud-speaker bases and horns, battery trays, switch bases, 'phone plugs and connectors, volt and ammeter cases, all these are made of or contain some plastic material.

To those who are engaged in the manufacture of these countless plastic molded goods the recent Radio Shows surely must have been both an inspiration and a pleasure, as the future of the Radio industry seems assured, and the fabricators of plastic products will just as surely continue to play a highly important part.

—o—

M. Herman Leppick has been placed in charge of the splendid new toilet ware department of one of Columbus, O., best known stores, The Fashion.

—o—

### Celluloid Co. Exhibits Line of Toilet Ware

The Celluloid Company exhibited an interesting line of toilet ware at the Fourth Annual Exposition of Women's Arts and Industries, held at the Hotel Commodore, New York, September 21st to 26th, 1925.

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The Woman's Athletic Club, of Chicago contemplates the installation of a high grade toilet goods department.

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Fort Worth, Texas is welcoming the opening of the new store of Sanger Bros. The toilet ware department and the buying of such commodities will be in the hands of Miss Louise Doughty.



**"Pyroxylin Outlook Good,"  
Says Morris Marx**

A feeling of confidence pervades the pyroxylin industry at the present time and the immediate outlook for better business is very good. One of the representative leaders in the Pyroxylin Plastics field, Mr. Morris Marx, President of the Pyroxylin Fabricators Association, recently expressed himself in an interview to this effect. Mr. Marx said:

The fabricators of pyroxylin plastics and especially the toilet ware industry can look serenely into the future, especially if they can enlist the cooperation of the large manufacturers of the raw material, and that is apparently an event "just around the corner." Uniformity of quality, uniformity of price, and the proper appreciation of the fact that the buyer who contracts for very large amounts must be shown proper appreciation, as he, by carrying such large stocks is helping to finance the manufacturer, will do much to stabilize the industry and to make working in at a pleasure and a profit.

**Pyradiolin Radio Panels**

E. I. Du Pont de Nemours & Co. showed their line of Pyroxylin Plastic radio panels, aptly called *Pyradiolin*, at the recently held radio exhibitions. These panels differ from those made from synthetic resins in being considerably more flexible, which is the chief advantage claimed by the manufacturers. In electrical properties these panels appear to make a good showing. Their volume resistivity is 8 million megohms per centimeter cube, surface resistivity 20 million megohms per square centimeter, the power factor 0.036 radians 2.1 degrees at all frequencies, and the dielectric constant varies from 5.7 at 1 kilocycle to 4.8 at 500 kilocycles (600 meters). Pyradiolin is highly water resistant absorbing only 3-100 of one percent of water on six hours immersion.

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